Transgrid Group

Annual Safety Performance and Bushfire Preparedness Report

Electricity Network Safety Management System 2023 - 24

People. Power. Possibilities.

Contents

About this Report

This is the Annual Safety Performance and Bushfire Preparedness Report for Electricity Network Safety Management System 2023 - 24 for (ACN 609 169 959), NSW Electricity Networks Assets Pty Limited (ACN 609 169 922) and Lumea Pty Limited (ACN 626 136 865) (together referred to as the Transgrid Group, the Group or we, us or our,). It covers the financial year period 1 July 2023 to 30 June 2024 (this year, FY24 or 2024).

Acknowledgement of Country

In the spirit of reconciliation, the Transgrid Group acknowledges the Traditional Custodians of the lands where we work, the lands we travel through and the places in which we live. We pay respect to the people and Elders past, present and emerging and celebrate the diversity of Aboriginal and Torres Strait Islander peoples and their ongoing cultures and connections to the lands and waters of NSW and the ACT.

1. Introduction

This report provides information about the performance of Transgrid's Electricity Network Safety Management System (ENSMS) as implemented in accordance with the Electricity Supply (Safety and Network Management) (ESSNM) Regulation 2014 and Australian Standard AS 5577. This report has been produced in accordance with IPART's *Electricity Networks Reporting Manual (Safety management systems performance measurement) September 2022* (Reporting Manual). In addition, the reporting provides information on Transgrid's bushfire preparations for the upcoming 2024/25 fire season.

In the reporting period, Transgrid continued to maintain its ENSMS and supporting Management Systems to meet the requirements of the ESSNM Regulation. Transgrid's ENSMS defines the interface and integration of the various corporate frameworks and management systems that implement risk controls to ensure that the objectives of the ESSNM Regulation are met.

Transgrid is committed to delivering the following objectives through its ENSMS:

- the safety of members of the public
- the safety of person(s) working on the network
- the protection of property (whether or not belonging to Transgrid)
- the management of safety risks arising from the protection of the environment (for example, preventing bushfires that may be ignited by network assets)
- the management of safety risks arising from the loss of electricity supply.

Transgrid's ENSMS is supported by the following Management Systems:

- a Health and Safety Management System certified to ISO 45001
- an Asset Management System certified consistent with ISO 55001
- an Environmental Management System certified to ISO 14001.

This report includes the safety performance of all network assets (including prescribed and contestable assets) operated by Transgrid within NSW and the ACT.

Section 2 of this report provides an overview of the ENSMS safety performance for the period 1 July 2023 to 30 June 2024 in line with Reporting Manual Appendix A.

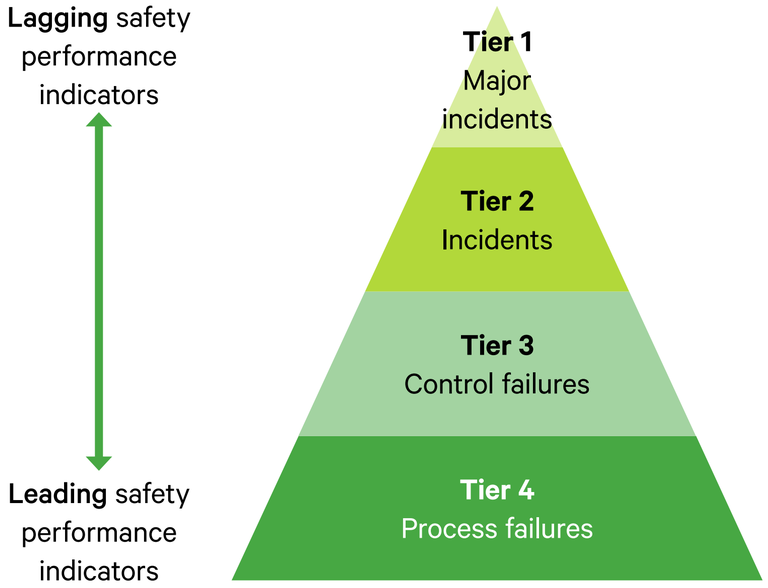
Section 3 of this report covers Bushfire Preparedness for the period from 1 October 2023 to 30 September 2024 in line with Reporting Manual Appendix C. It allows Transgrid to provide meaningful data to IPART and the broader community on bushfire risk mitigation programs as well as our performance in managing bushfire risk.

Transgrid Group

2. Annual safety performance reporting for 2023/24

Transgrid measure network safety though a performance management framework in which an understanding of the risk control measures that are in place and the degree to which they are operating effectively acts to assist in avoiding incidents with serious consequences. This performance management framework, shown in Figure 1 aligns with the ENSMS performance reporting required by IPART to be included within this report.

Figure 1: Network Safety Performance Management Framework



Tier 1 and Tier 2 incidents in the framework are lagging indicators of performance and represent occasions when the risk controls have failed to the extent that significant harm has occurred. These two tiers align with the definitions of Incidents and Major Incidents included in IPART's Incident Reporting Manual[1]. Details of incidents in each of these categories experienced by Transgrid during the reporting period are included in Sections 2.1 and 2.2 of this report.

Control failures and process failures are leading indicators of performance. By understanding the causes of these failures, Transgrid is able to make changes to its processes that can prevent incidents of harm occurring.

Sections 2.3 to 2.8 of this report detail incidents where risk controls have failed, resulting in failures that did not have a safety impact. These represent opportunities to improve controls to prevent similar failures in future and prevent potential harm incidents.

Sections 2.9 to 2.15 discuss the control processes that are in place to manage the risks to achieving ENSMS objectives and highlight deficiencies and improvements made to processes.

2.1. Tier 1 – Major incidents

Table A.1 Major incidents

ESSNM objective		Description of each major incident reported under the Reporting Manual - Incident Reporting requirements
Safety of members of the public		Nil
Safety of persons working on network		• In March 2024, on Line TL96P, a delivery partner worker received an electric shock when his knuckles came into contact with the structure earthing system due to an elevated high resistance tower earth • In March 2024, on Project Energy Connect (PEC), a worker involved with termination activities accidently cut through a live cable • In March 2024, on PEC, whilst stringing between towers 73 and 74, the pulling rope failed causing the conductor to drop onto the hurdle and swing back onto the live 22kV line that was under the hurdle. This damaged the line and tripped the circuit
Protection of property	Third party property	Nil
	Network property[2]	Nil
Safety risks arising from loss of electricity supply[3]		Nil

1 Incident reporting Electricity networks reporting manual IPART June 2023
2 Network property losses are not reportable under IPART's Reporting Manual - Incident Reporting requirements. For the purpose of this report, Transgrid is to report each event in which losses exceed $500,000 in relation to damage caused to electricity works (electricity power lines or associated equipment or electricity structures that form part of a transmission or distribution system) as defined in the Electricity Supply Act 1995.
3 As defined for major reliability incidents in IPART's Reporting Manual – Incident Reporting.

2.2. Tier 2 – Incidents

Table A.2 Incidents

ESSNM Objective	Description of each major incident reported under the Reporting Manual - Incident Reporting requirements
Safety of members of the public	In June 2024 unauthorised tower climbing incident occurred near Edgeworth on Line TL94/96
Safety of persons working on network	In June 2024 near Lenaghan a concrete boom pump came in proximity of line TL82 causing a flashover
Protection of third party property	In April 2024 the NSW Telco Authority informed Transgrid that Transgrid data was exposed and stolen in the HWL Ebsworth Cyber breach incident that occurred in April 2023
Safety risks arising from loss of electricity supply[4]	Nil

2.3. Tier 3 – Control failure near miss

Table A.3 Network asset failures - Control failure near miss, provides a breakdown of Transgrid's asset types, the population of these asset types, functional failure details and whether these failures resulted in a fire. Asset types not owned by Transgrid are excluded from the table.

Performance measure	Population	5-year average annual functional failures[5]	Annual functional failures (for reporting period)					
			Unassisted			Assisted		
			No fire	Fire		No fire	Fire	
				Contained	Escaped		Contained	Escaped
Towers	14,617	0.6	0	0	0	0	0	0
Poles (including stay poles)[6]	23,175	2.6	1	0	0	2	0	0
Conductor – transmission overhead[7](km)	13,135	24.2	1	0	0	0	0	0
Conductor – transmission underground (km)	109	0.4	1	0	0	0	0	0
Power transformers[8]	215	6	3	0	0	2	0	0
Reactive plant[9]	180	12.4	6	0	0	2	0	0
Switchgear – transmission	15275	18	12	0	0	2	0	0
Protection relays or systems	3561	8	6	0	0	0	0	0
Transmission substation SCADA system	2252	6	3	0	0	0	0	0
Transmission substation protection batteries[10]	264	13.2	13	0	0	0	0	0

In 2019/20, a large number (>100) of conductors were damaged due to bushfires. Therefore the 5-year average functional failure is much higher than the number recorded in 2023/24. The other functional failures in 2023/24 are comparable to the 5-year average for most asset classes.

4 As defined for reliability incidents in IPART's Reporting Manual – Incident Reporting.
5 Transgrid defines an asset functional failure to be when a network asset is unable to meet the expected or specified performance standard.
6 Transgrid pole population is the count of pole structures. e.g., a structure consisting of 3 poles is counted as 1
7 Transmission voltages are generally 33kV AC nominal and above. Transmission conductors form part of a transmission network.
8 Power Transformers are transformers where the secondary/output voltage is 5kV nominal or above.
9 Reactive plant includes reactors, capacitors, and static VAR compensators
10 The count of battery systems includes total count of batteries and chargers.

2.4. Vegetation contact with conductors

Transgrid's maintenance plan for easements and access tracks defines the outcomes for the vegetation management program that contribute to demonstrating that the risks associated with vegetation / conductor contact are being managed as low as reasonably practicable. The effectiveness of the vegetation management program in achieving the maintenance outcomes is demonstrated by the lack of fire starts or supply interruptions due to vegetation growing into the network over the last five reporting periods.

Transgrid has a separate maintenance plan for the management of hazard trees, which are trees that may pose a risk to the network by falling onto lines from outside the defined trimming clearance distance. This plan, which was developed in 2019 in response to a significant number of historic hazard tree-related incidents, has seen a significant reduction in the number of incidents of this type. The plan recognises that due to the length of the network and the number of trees that could pose a fall-in hazard, it is not possible to eliminate this risk, however, it sets out a process for evaluating the risk posed by each identified hazard tree and prioritises tree management to ensure that the risk is managed as low as reasonably practicable.

Table A.4 lists all events where vegetation has contacted Transgrid conductors leading to a fire or a supply interruption.

Table A.4 Vegetation contact with conductors

Performance measure[11]	Event count					Comments on 2023/24 events
	Current reporting period	Last reporting period	Two periods ago	Three periods ago	Four periods ago	
Fire starts – grow in	0	0	0	0	0	No events during 2023/24 reporting period
Fire start – fall in and blow in	0	1	0	0	0	
Interruption[12] – grow in	0	0	0	0	0	
Interruption[12] – fall-in and blow in	0	2	2	1	2	

11 Vegetation hazard definitions as per the Industry Safety Steering Committee Guide for the Management of Vegetation in the Vicinity of Electricity Assets (ISSC3).
12 Includes momentary interruptions.

2.5. Unintended contact, unauthorised access and electric shocks

Table A.5 lists all events where someone, livestock or domestic pet, vehicle or machinery has inadvertently contacted Transgrid assets resulting in an electric shock or injury, unauthorised access, or a breach of safe approach distances. Transgrid is not a party to the Accredited Service Provide Scheme applicable to distribution networks; these are reported as Public Worker incidents in this report.

Table A.5 Unintended contact, unauthorised access and electric shocks

Detail	Event count					Comments on 2023/24 events
	Current reporting period	Last reporting period	Two periods ago	Three periods ago	Four periods ago	
Electric shock[13] and arc flash incidents[14] originating from network assets[15] including those received in customer premises						
Public	0	0	0	0	0	
Public worker	0	0	0	0	0	
Network employee /network contractor[16]	1	0	1	2	0	In March 2024, on Line TL96P, a delivery partner worker received an electric shock when his knuckles came into contact with the structure earthing system due to an elevated high resistance tower earth
Livestock or domestic pet	0	0	0	0	0	
Contact with energised overhead network asset (e.g. conductor strike)						
Public road vehicle[17]	0	0	0	0	0	
Plant and equipment[18]	2	0	1	1	0	• In June 2024 near Lenaghan a concrete boom pump came in proximity of line TL82 causing a flashover • In March 2024, on PEC, whilst stringing between towers 73 and 74, the pulling rope failed causing the conductor to drop onto the hurdle and swing back onto the live 22kV line that was under the hurdle. This damaged the line and tripped the circuit
Agricultural and other[19]	0	0	0	0	0	
Network vehicle	0	0	0	0	0	
Contact with energised underground network asset (e.g. conductor strike)						
Plant and equipment	0	1	0	0	0	
Person with handheld tool	1	0	0	0	0	
Unauthorised network access (intentional)[20]						
Transmission substation /switching station	0	5	5	5	1	
Tower / poles	1	0	0	1	2	In June 2024 unauthorised tower climbing incident occurred near Edgeworth on Line TL94/96
Other (e.g. communication sites)	0	1	0	1	0	
Safe Approach Distance (SAD)[21]						
Network employee /network contractor	0	0	1	1	0	
Public	0	1	0	0	0	
Public Worker	0	0	0	0	0	

13 All electric shocks are to be reported except those resulting from static discharge, defibrillators, where the system is nominally extra low voltage or involving the DC rail traction system.
14 Incidents that result in a burn or other injury requiring medical treatment and result from exposure to an arc.
15 Events caused by network assets, network asset defects or network activities, including shocks received inside customer installations are reported, noting that Transgrid's network has no direct connection to and therefore cannot cause shocks in customer installations.
16 Includes all classes of authorised persons.
17 Including plant and equipment packed up for travel (i.e. plant and equipment travelling on a public road to or from worksite).
18 Cranes, elevated work platforms, cherry pickers, excavators, handheld tools, etc.
19 Examples include agricultural equipment, aircraft and watercraft.
20 Includes all Transgrid-owned network facilities but excludes non-network locations such as depots.
21 Encroachment into the applicable Safe Approach Distance for the type of individual involved.

2.6. Reliability and quality of supply

The performance measures specified in Table A.6 of the Reporting Manual relate to events that occur on the distribution network and are not applicable to Transgrid as a Transmission Network Service Provider.

2.7. Reliability and quality of supply – critical infrastructure incidents

As a transmission network service provider, Transgrid indirectly supplies most customers and safety impacts due to loss of supply on the transmission network are generally able to be managed by the distribution network service provider through the interconnections built into their networks. Transgrid's Reliability Formal Safety Assessment does however define the types of connection that it considers to be critical and that may have safety impacts if supply to them is lost.

Table A.7 a Critical Infrastructure Incident Definitions

Critical Infrastructure	Description of risk
Directly connected customers	Customers that are directly connected to Transgrid's network may have limited alternate supply options. Supply failure may result in loss of critical equipment such as mine ventilation for which they need to have contingency in place
Regional localities with limited supply redundancy or radial feed	Regional localities, for example Broken Hill, have limited network redundancy. Critical loads such as hospitals, street lighting, communications equipment within the locality may not be able to be supplied and may result in safety impacts in the locality in the event of extended network outages
Major cities	Major cities such as Canberra, Sydney, Newcastle, and Wollongong are population centres that are highly affected by supply outages to critical substations
NSW / Australian Capital Territory	The majority of NSW, and the entirety of Canberra would be affected by a system black event that will likely take several days to restore resulting in catastrophic business loss and public safety consequences
Other jurisdictions	The NSW prescribed network contains critical interconnectors with Victoria, South Australia (in-development), and Queensland. Loss of supply events that affect these connections can result in supply constraints and system stability issues for these adjacent systems

Table A.7 contains a listing of all Transgrid loss of supply events which impacted critical infrastructure. Transgrid counts all loss of supply events which do not meet exclusion criteria set out by the Australian Energy Regulator in the Service Target Performance Incentive Scheme (STPIS).

Exclusion events include the following:

- Outages shown to be primarily caused or initiated by a fault or other event on a third-party system
- Outages on assets that are not providing prescribed transmission services
- Outages caused by a direction from emergency services or AEMO.

Table A.7 Reliability and Quality of Supply - Critical infrastructure incidents

Type of critical infrastructure	Minutes of supply lost	Cause	Consequential safety impacts associated with supply issue
Direct connected customer – Tomago Aluminium Smelter	116 minutes	In June 2024 near Lenaghan a concrete boom pump came in proximity of line TL82. Refer also Table A.2	Loss of supply to an industrial facility may have a range of safety impacts for people working on site
Regional localities with limited supply redundancy or radial feed – Broken Hill 22kV bus	209 minutes	In November 2023, the No.1 Gas Turbine tripped during a planed outage of the Buronga to Broken Hill Transmission line, followed by a subsequent trip the No.2 Gas Turbine. Supply was restored on the same day.	Loss of supply to Broken Hill impacted numerous facilities that may have a safety consequence
Regional localities with limited supply redundancy or radial feed – Broken Hill 22kV bus	273 minutes	In November 2023, overheating of the No.2 Gas Turbine during a planned outage of the Buronga to Broken Hill Line X2 necessitated load-shedding	Loss of supply to Broken Hill impacted numerous facilities that may have a safety consequence

2.8. Network-initiated property damage events

Table A.8 lists all events leading to either third party or Transgrid property damage which have been initiated by Transgrid's electricity assets or asset life cycle activities, including any event where there is a reasonable likelihood that damage was caused by electricity works (electricity power lines or associated equipment or electricity structures that form part of Transgrid's transmission system).

Table A.8 Network- initiated Property damage events

Detail	Event count					Comments on 2023/24 events
	Current reporting period	Last reporting period	Two periods ago	Three periods ago	Four periods ago	
Third party property (assets including vehicles, buildings, crops, livestock)						
Damage (e.g. fire, physical impact or electrical)	0	0	0	7	0	
Network property (including non-electrical assets including vehicles, buildings)						
Damage (e.g. fire, physical impact or electrical)	0	1	0	1	2	

The following events are excluded from the counts above (from 2023/24 onward):

- Minor damage to Transgrid assets, plant, machinery, and property, during construction or maintenance activities or vehicle movements
- Failure of mobile plant or machinery during construction or maintenance activities
- Asset failures which only resulted in damage to the asset itself.

2.9. Tier 4 Control implementation

Transgrid's formal safety assessments are based on *AS5577 – Electricity Network Safety Management Systems*. A formal safety assessment considers the hazards that might be associated with activities on or near the electricity network and is aligned with the principles of *AS/NZS ISO 31000 - Risk Management*.

Formal safety assessments are on a three-year review cycle but may also be updated out of the regular cycle if an incident highlights a significant control failure that must be addressed, or controls can be improvement though continuous improvement initiatives[22].

Table A.9 provides details of updates that were made to Transgrid's five formal safety assessments and any related risk treatment action plans during the reporting period.

Table A.9 Amendments and improvement to Formal Safety Assessments (FSA) or associated Risk Treatments

FSA	Amendments / improvements
Public safety	FSA was updated in November 2023. Updates included: • Alignment of bowties with the Reliability FSA • Introduced the concept of reasonable worst-case for risk assessing High Potential Incidents • Enhanced stakeholder consultation details
Worker safety	FSA was updated November 2023. Update included: • General administrative updates to align to revised organisational structures • Inclusion of historical performance of critical risk incidents • Critical Risk 10. Excavation and Trenching added • Relocation of Health and Safety Risk Assessment to the HSE Risk Profile and the Completeness Review (Appendix A)
Bushfire	This FSA was updated in October 2024 (Post reporting period) with: • Alignment of bowties with the Reliability FSA • Introduced the concept of reasonable worst-case for risk assessing High Potential Incidents • Enhanced stakeholder consultation details • Major update to the bow-ties to provide better granularity of the controls to address specific threats • Separation of the threat asset failure into a threat for each asset class • Removal of Bushfire risk to Transgrid, this being moved to the Reliability FSA
Environment and property	No updates occurred to this FSA in the reporting period
Reliability safety	This FSA was updated in October 2024 (Post reporting period) with: • Better description of the scope and context of this FSA • Major update to the bow-ties to provide better granularity of the controls to address specific threats • Separation of the threat asset failure into a threat for each asset class • Improved identification of threats and associated controls related to physical and cyber security • Addition of external bushfire threat to Transgrid, this being moved from the Bushfire FSA

2.10. Design, construction and commissioning

The following table provides counts of completed Safety in Design reports, safety reviews and project close out reports.

Commentary on Table A.10. Only NSW electricity distributors have obligations under the NSW Accredited Service Provider Scheme, hence performance measures related to the following categories are not applicable:

- Contestable designs
- Contestable projects

Table A.10 Design, construction and commissioning

Performance measure	Number of designs/projects				
	Current reporting period	Last reporting period	Two periods ago	Three periods ago	Four periods ago
Designs for which Safety in Design (SiD) reports have been completed	191	279	225	277	497
Designs for which Safety in Design (SiD) reports have been audited	191	279	225	277	497
Safety reviews performed[23]	2691	947	608	169	0
Project closeout reports completed	77	142	143	172	60
Project closeout reports audited	10	1	0	0	0

22 Adjustment or modification to Transgrid's formal safety assessments, or risk treatment action plans, including those changes informed by consideration of the results of the investigation and analysis of incidents, near misses or asset failures, where Transgrid has assessed that existing assessments or risk treatments do not eliminate or reduce risk so far as is reasonably practicable.

23 The incident reporting processes have been improved since the last reporting period, A safety review includes checking that work on or near the network is being performed safely. Transgrid now includes pre-mobilisation audits, post mobilisation audits and project health checks, process audits which are reported in the following categories: 1. Critical Risk Control Checks (CRCC): the number of actions and practices undertaken by leadership, from site supervisors to executives, to manage Transgrid's ten critical risks in the field. 2. Leadership Safety Conversations (LSC): the number of safety conversations completed and recorded by Leadership with their Teams. 3. Heads Up Conversations (HUC): the number of safety conversation completed and recorded by trained leaders in the field.

2.11. Inspection (assets)

Table A.11 provides counts of Inspection and associated Corrective Action tasks for the key asset classes on Transgrid's network that were planned or completed during 2023/24.

At Transgrid, maintenance tasks, including inspections, are allocated as work orders. Inspection task numbers shown in the table represent individual work orders, which for transmission lines (overhead and underground) may include large numbers of spans up to an entire feeder per work order.

Inspection activities are designed to identify asset condition issues that carry a risk of failure due to a known or potential failure mode. An additional inspection is carried out every year in the period leading up to the start of the bushfire danger period for the purposes of identifying defects that give rise to the risk of a network-initiated bushfire. These pre-bushfire danger period inspections are not included in this table but are included in Table C.2.

Corrective action tasks are those arising from inspections where an asset defect is identified. The failure risk associated with specific defects is determined by the asset inspector with guidance from a catalogue of defect types and severities. The level of failure risk determines the priority and rectification time assigned to each defect. Outstanding defects are ones that have not been rectified in the assigned timeframe.

Table A.11 Inspection (assets)

Performance measure	Inspection tasks				Corrective action tasks				Comments
	Planned inspections[24]	Achieved[25]	Open[26]	Outstanding[27]	Tasks identified	Achieved	Open	Outstanding	
Transmission substations	852	860	1,521	1	2,147	1,049	1,515	357	Overdue or Late work orders are due to some of the work being impacted by resource constraints. This work has been reviewed and re-prioritised during the period and higher priority works completed to manage risk. This is part of ongoing review of work orders in program.
Transmission overhead	1,039	1,109	1,730	11	923	618	1,175	11	
Transmission underground	159	163	329	0	116	120	8	4	

2.12. Inspections (vegetation) aerial /ground based

Table A.12 Vegetation inspections provide the number of inspections undertaken, either aerially or via a ground-based inspection crew. The objective of these inspections is to identify vegetation that is encroaching within the vegetation clearance requirements specified in Transgrid's maintenance standards. Rectification of the defects found during these inspections form Transgrid's routine vegetation management program.

At Transgrid, vegetation inspections are allocated as work orders and these tasks generally include large numbers of spans on a single work order up to an entire feeder per work order. Pre-summer vegetation related bushfire inspections counted in Table C.2 have been excluded from this table. Note that the span population of 37,890 shown in the table is the entire population across the network, which are inspected by a combination aerial and ground-based inspections.

Table A.12 Inspections (vegetation) Aerial/ Ground based

Inspection type	Population (no. of spans)	Target	Achieved	Outstanding	Comments
Third party property (assets including vehicles, buildings, crops, livestock)					
Total	37,890	305	305	0	
Ground-based					
Total	37,890	267	267	0	

24 Includes all 'Open' and 'Outstanding' tasks from the previous reporting period.
25 Inspection tasks are only reported as 'Achieved' when all associated corrective action tasks to address the faults of a particular asset have been identified.
26 Open' and 'Outstanding' tasks are those tasks categorised as such at the end of the reporting period.
27 Commentary provided to explain the management of risk associated with outstanding tasks and when the outstanding tasks are expected to be completed.

2.13. Public electrical safety plans and activities

Transgrid maintains a Public Electrical Safety Awareness Plan that assists in mitigating the risks presented in and the following table. The most recent edition of the plan was published on 22 September 2023.

Table A.13 a Hazardous Events Identified in the PESAP

Top Event	Hazard / Hazardous Event	Description of risks
Loss of control of electricity	• Conductor drop / Structure fail • Asset Fire / Explosive failure • Earthing / Induced Voltage	Risks to the public due to asset failures that allow a release of explosive or electrical energy into the general environment. Outcomes include injury or electrocution of public third parties operating near the network
Loss of control of external influences	Third party activities near assets	Risks to the public due to work activities adjacent to the network who inadvertently enter safe approach distances
	Unauthorised access to assets	Risks to the public from access our assets for misadventure, sabotage, self-harm, etc. that bring them in contact with electricity
Loss of control of Transgrid Asset Life cycle activities	Third party activities near assets	Risks to the public due to activities Transgrid undertake to build, operate, and maintain the assets. This includes protecting the public from areas where construction activities are being undertaken prior to energisation of the assets

Based on geographical operational area, construction activity, and local community living and working in the vicinity of our assets, we target campaigns to raise safety awareness. The following programs and activities were undertaken in 2023/24 to promote public knowledge and understanding of electricity network safety hazards, and are targeted to a broad public spectrum based on the hazardous events identified in Transgrid's ENSMS:

Table A.13 Public electrical safety plans and activities

Public Awareness Activity	Rationale
Community and stakeholder engagement	Community consultation has been undertaken targeting new transmission infrastructure including transmission lines and substations. Specific consultation regarding Transgrid's safety approach with an emphasis on bushfire risk management occurred as follows • VNI West Community Consultation Group engagement December 2023 • Humelink Community Consultation Group engagement March 2024 Community and stakeholder engagement is embedded within all aspects of Transgrid's operations. This includes engagement with the local community when Transgrid operations may have an impact on that community, especially when it involves introducing hazards associated with those operations. Stakeholder engagement also involves participation in forums such as the NSW Industry Safety Steering Committee to enable sharing of best safety practices
Communication with emergency services	Emergency services are often required to operate in the vicinity of Transgrid assets during abnormal, emergency conditions. Transgrid communicates with the emergency services to inform them of the hazards associated with these assets. • On 5 September 2023 Transgrid ran a multi-level exercise involving the activation of both the Network Emergency Management Team (EMT) and the Crisis Management Team (CMT). In attendance with the CMT was the Director of the Energy & Utilities Functional Area Coordination (EUSFAC, NSW Govt) • In November we facilitated a Fire Agency Engagement Day at Wallgrove, for sharing understanding and relationship building. In attendance were senior members of NSW RFS, ACT RFS, NSW Fire & Rescue, Forestry Corp, NSW Parks and Wildlife, Transgrid (Executive, Network, Delivery & Maintenance, Lumea, Risk and Resilience groups) • In January we facilitated a Fire Agency Engagement at Marangle Substation (Snowy 2.0), for sharing understanding and relationship building. In attendance were senior members of NSW RFS, Forestry Corp, NSW Parks and Wildlife, Transgrid, and UGL
Traditional newspaper and social media updates related to network safety management	Transgrid undertook a specific public safety campaign targeting safety around easements. This was published on Facebook, Instagram, and LinkedIn on 24 June 2024. This included communication of the updated easement guideline. This campaign included the placement of advertisements in ACT newspapers between 15 and 20 June. These campaigns raise awareness of the Transgrid Easement Guidelines document for anyone living or working with electricity transmission lines with a specific focus on fences and educating the public on the requirements for fencing instalments within Transgrid Easements
Updates to public safety information provided on Transgrid's internet site	Transgrid has undertaken updates to the following items on the safety pages of its public internet site: • Major update to the 'Managing Bushfire Risk' and 'Easement Guidelines' • Minor refresh performed to all other factsheets related to working near Transgrid assets • Awareness information on Transgrid's Thermography and Helicopter Patrol activity

2.14. Internal audits performed on any aspect of the ENSMS (as per AS 5577 clause 4.5.4)

Transgrid develops a three-year Asset Management System (AMS) / ENSMS audit plan that is refreshed annually to ensure that it remains aligned with organisational strategies and plans, key risk areas and stakeholder expectations. The audit team works with the Asset Managers to develop the audit program, to ensure that over time all aspects of the AMS and ESNMS are covered.

It is noted that the AMS and ESNMS are closely aligned and the ENSMS objectives are included in the asset management objectives. Audits of the AMS are therefore relevant to the ENSMS audit program.

Table A.14 Internal audits performed on any aspect of the ENSMS lists audits and associated actions and non-compliances which are relevant to the ENSMS.

Table A.14 Internal audits performed on any aspect of the ENSMS (as per AS 5577 clause 4.5.4)

Audit scope	Identified non-compliances[28]	Actions
Reliability And Bushfire – Target Area Review	• 3 Low risk outcomes • 10 Opportunities for improvement	An improvement in the methodology for showing that risk is identified ALARP is being made in risk related documents
Asset Management System Health Check	• 2 Low risk outcomes • 11 Opportunities for improvement identified	Improvements are being undertaken to identification of objectives accountabilities is being made in management system documents
Automation Systems - Control Assurance Review	No non-conformances	Planned and corrective maintenance controls were effectively implemented for the sites in-scope for the assessment
Transmission Line Routine Inspection And Maintenance – Control Assurance Review	• 1 Medium risk outcome • 9 Low risk outcomes	Drones are new technology for performing inspections and improvements have been identified to processes to ensure safer field operation
Hazard Tree Management - Control Assurance Review	• 1 Medium risk outcomes • 8 Low risk outcomes • 8 Opportunities for improvement identified	Improved processes are being implemented to provide better close out of the outcomes of investigations and management of data quality being received from the inspections
Corrective Maintenance Substation Asset – Control Assurance Review	• 1 Partially effective control identified • 6 Opportunities for improvement identified	Improvement being made to closure of internal work request processes
Routine Inspection And Maintenance Substation Assets – Control Assurance Review	• 1 Partially effective control • 6 Opportunities for improvement identified	Gaps are being rectified between maintenance plans and implemented inspections
Equipment Specification And Procurement – Control Assurance Review	• 1 Medium risk outcome • 3 Opportunities for improvement	Updates are being made to design processes to improve communication of required design actions
Control Assurance Process Review - CAR	• No non-compliances • 1 Opportunity for improvement identified	No non-conformances

28 Only non-compliances that are related to ENSMS or safety issues.

2.15. External audits performed on any aspect of the ENSMS (as per AS 5577 clause 4.5.4)

The AMS / ENSMS audit plan includes audits carried out by external parties as well as those carried out by Transgrid internal staff.

Table A.15 lists external audits and associated actions and non-compliances which are relevant to the ENSMS.

Table A.15 External audits performed on any aspect of the ENSMS (as per AS 5577 clause 4.5.4)

Audit scope	Identified non-compliances	Actions
2023 ISO 55001 Certification Audit	3 Minor non-conformances	Certification received for another 3 years • No safety related issues were received
ISO 45001 WHS Management System / ISO 14001 Environmental Management System Re-Certification Audit 2023	1 Minor non-conformance	Re-Certification received for both management systems • Actions being undertaken to improve the management of reported hazards to ensure closure of issues
ENSMS Audits	N/A	Transgrid was not subject to any direction to perform external audits from IPART

Audits listed may include consideration of systems or assets that are common across all jurisdictions where Transgrid's network exists. Audits undertaken on assets or systems that are located or used exclusively outside of NSW have not been included in Table A.14 or Table A.15.

3. Bushfire preparedness for summer 2024/25

As part of its activity to ensure that its network and network operations are well prepared to manage the elevated risk of a network-initiated bushfire over the summer months, Transgrid undertakes an annual preparedness review that examines the status of established operational risk controls. The intent is to ensure that all controls are fully implemented and operating effectively so that both the risk of Transgrid's network or network operations initiating a bushfire and the consequences of a bushfire impacting its network are managed as low as reasonably practicable. The outcomes of this review are documented in a Bushfire Preparedness Report, which provides visibility of bushfire preparedness and risk management activity to Transgrid senior management prior to the start of the bushfire danger period.

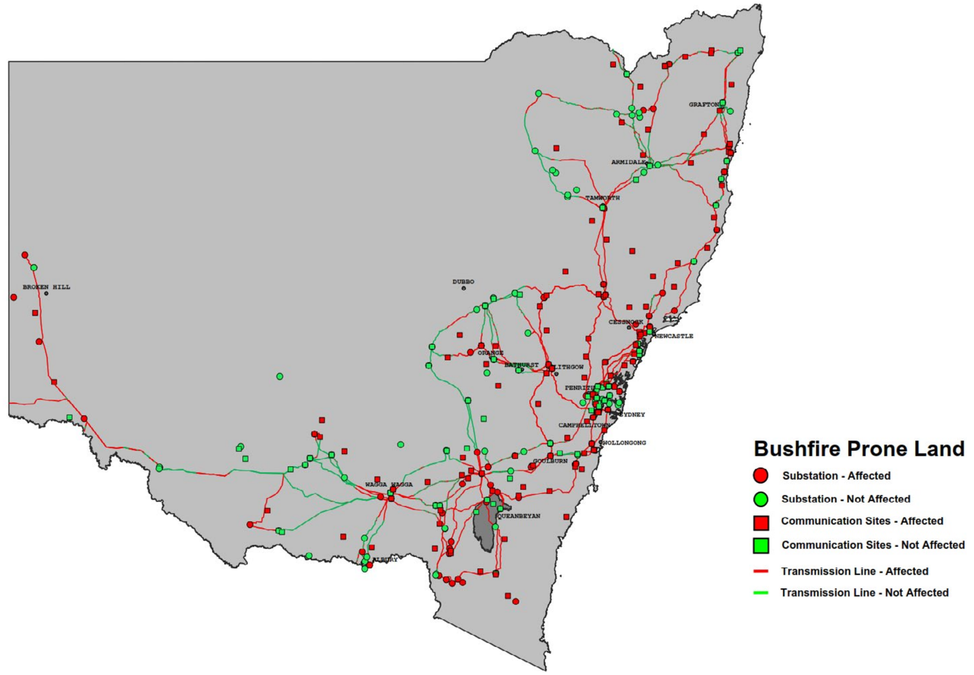
As part of ensuring its preparedness, on 29 August 2024 Transgrid presented a webinar for all staff reminding them of the operational requirements over the bushfire danger period. Workers were reminded that when undertaking hot and fire risk work, that they need to ensure they have considered the proposed work, the bushfire danger rating, and the daily weather forecast, in accordance with the Hot Work and Fire Risk Work procedure.

This webinar was recorded and made available for any staff who were unable to attend the live session.

3.1. Bushfire risk profile across Transgrid's supply area

Transgrid utilises a variety of decision-support tools to understand bushfire-associated risk across its network and prioritise risk mitigation activities. In particular, Transgrid utilises the Phoenix bushfire risk consequence model to determine the potential consequences of a bushfire initiated anywhere across its network as well as the RFS bushfire prone land information to guide the maintenance and other risk management activities across the network.

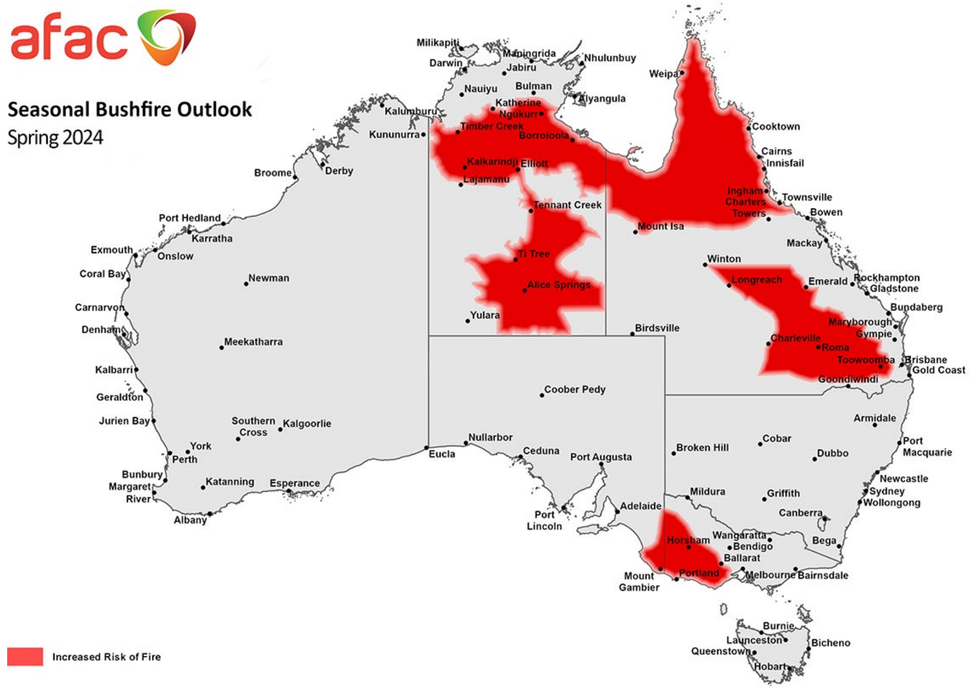
Figure 2: Transmission Network Bushfire Risk Profile shows the bushfire risk profile across the state.
(Source: Bushfire Prone Land is based on Rural Fire Service of New South Wales data sets).



Another part of Transgrid's review of its bushfire preparedness is a consideration of the climatic conditions that are forecast to occur over the bushfire danger period. While the forecast does not directly impact on Transgrid's preparations, it is considered as a factor that impacts both the likelihood and consequence of bushfire risks when the overall adequacy of the established controls is considered.

The Australasian Fire and Emergency Service Authorities Council (AFAC) prepares a seasonal bushfire outlook on a quarterly basis that provides details of the expected fire conditions by state for the upcoming season. The information contained in this report is derived from information from the Bureau of Meteorology, jurisdictional fire authorities and other relevant organisations.

Figure 3: Spring bushfire outlook shows the national outlook for Australia for Spring 2024, the most recent information available at the time of publication. Importantly, there is no forecast increased risk of bushfire across NSW and the ACT.
(Source: afac).



AFAC advised that:
NSW

"Average to above average rainfall in winter largely prevented prescribed burning across NSW.

Due to the existing and forecast wet conditions, normal fire potential is predicted across the state for spring"

ACT

"Normal bushfire risk during spring expected for the ACT.

The long-range outlook for spring predicts warmer conditions with average rainfall.

Fire agencies and land managers will conduct prescribed burning during spring to mitigate potential hazards."

At a macro level, changes in the weather-related risk of fire will be driven by the weather patterns associated with La Niña or El Niño.

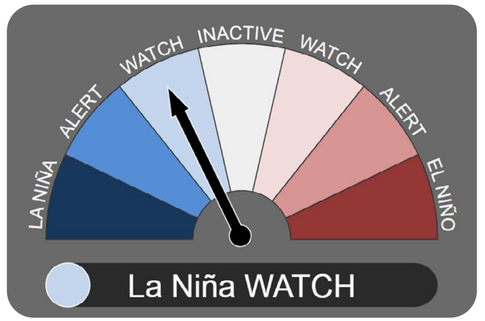


Figure 4: ENSO outlook remains neutral with a chance of La Niña development during spring (source bom.gov.au) shows that the current outlook is neutral with a chance of La Niña development during spring. La Niña is typically associated with cooler, wetter conditions and therefore it is expected that the bushfire risk will not increase substantially. Nevertheless, Transgrid takes all reasonable steps to ensure that its network is as well prepared as possible to avoid a potential network-initiated bushfire and to manage any impacts of bushfires on its network.

3.2. Permanent /temporary declaration of areas by RFS and Transgrid's actions

The Rural Fires Act 1997 provides for a statutory Bushfire Danger Period (BFDP) commencing 1 October and ending 31 March in the following year. This period can be varied due to local climatic conditions and remains in force for the period specified unless it is revoked.

Transgrid cannot predict the early declarations by the NSW RFS to enact operational changes to respond to heightened bushfire risk, if necessary. Transgrid therefore aims to have all its pre-bushfire danger period preparation complete by 1 September to enable it to manage any risks associated with elevated fire danger prior to the statutory start of the BFDP. The end of the BFDP is similarly variable so for reporting purposes, Transgrid considers the end of the BFDP to be 31 March.

The 2024/25 Bushfire Danger Period was declared to be in effect in 42 of 139 fire districts prior to the start of October.

Transgrid will remain in close contact with the RFS and Energy Utilities, ACT Fire and Rescue, and Functional Area Co-ordinator EUSFAC across the season to enable it to understand any changes to the risk position across the network.

3.3. Pre-summer bush fire inspections

In addition to the routine inspection cycles discussed in Sections 2.11 and 2.12, assets and easements are inspected annually prior to the start of the bushfire danger period to ensure that there are no defects with the potential to initiate a bushfire.

The status of Transgrid's pre-summer bushfire inspections is given in the tables below and includes all inspection tasks raised or completed during the 12-month period to 30 September 2024, where bushfire risk is being managed. At Transgrid, inspections are allocated as work orders. For transmission lines and easement/vegetation inspections they generally include large numbers of spans on a single work order up to an entire feeder.

Pre-summer inspections include:

- Annual Light Detection and Ranging (LiDAR) inspection is the process of 3D laser scanning of ground, electricity infrastructure and vegetation, to determine locations where the vegetation clearance to wires does not meet requirements.
- Annual Compliance inspection is a ground inspection of the easement where scheduled LiDAR scan of the span did not or could not occur.
- Annual Aerial inspections undertaken from a helicopter to provide a high degree of assurance that the easements and transmission lines do not pose a bushfire or safety risk.

Table C.1 Pre-summer bush fire inspections

Pre-summer bushfire inspections	Population (spans / structures)	Target (No. of inspections)	Achieved (No. of inspections)	Outstanding (No. of inspections)	Comments
Inspections	37,890	1,148	1,148	0	• For all asset classes including Easements • Transmission line inspections are scheduled for completion in October.

3.4. Vegetation tasks

Table C.2 provides a count of identified vegetation defects and the status of their rectification. Vegetation defects include encroachments into the defined vegetation clearance requirements (VCR), as well as hazard trees that are located off our easement, but large enough to fall into contact, or dangerously near a power line. These are trees that, if developing a structural defect, will have the potential to impact or come within Vegetation Clearance Requirements (VCR) of the transmission line (operating at Maximum Line Operating Conditions) or its structures should whole or parts of the tree fall.

The NSW Industry Safety Steering Committee guide ISSC3 Guide for the Management of Vegetation in the Vicinity of Electricity Assets defines requirements for the management of vegetation around distribution networks, however, because of the different nature of Transgrid's network, the transmission network is specifically excluded from the scope of the guide. Transgrid's vegetation management practices and requirements are defined in its Maintenance Plan – Easements and Access Tracks. The plan includes definitions of and rectification requirements for the different categories of encroachment defect and hazard tree included in Table C.3. The basic approach is to set a minimum safe approach distance and to define the VCR based on the expected growth rate of the tree such that the safe approach distance should not be encroached upon between trimming cycles. Defect priorities are determined based on how soon the safe approach distance is expected to be encroached.

Hazard trees are assessed by an experienced arborist and prioritised according to the risk of failure and potential to impact the network. An annual program for hazard tree removal is established based on these priorities.

Table C.2 Vegetation tasks

Bushfire risk category	Status	Grow-in P1	Grow-in P2	Grow-in P3	Hazard trees - Urgent	Hazard trees - Failed	Hazard trees - Potential
Bushfire Prone	Identified	0	34	528	12	2	1
	Completed	0	34	528	12	2	1
	Open	0	0	0	0	0	0
	Outstanding	0	0	0	0	0	0
Non-Bushfire Prone	Identified	0	4	103	1	0	1
	Completed	0	4	103	1	0	1
	Open	0	0	0	0	0	0
	Outstanding	0	0	0	0	0	0

3.5. Asset tasks

Table C.3 provides counts of defect and based tasks associated with managing bushfire risks, raised, or completed during the 12-month period to 30 September 2024, split into Substations, Transmission Lines, Automation (includes protection, communication, controls, and metering type asset classes) and Network Property (property – substations and property – repeater site type asset classes).

The most common asset tasks in the table below include pole assessment or treatment, condemned pole replacement, transmission line bolt/nut/fitting, insulator, bond, guy wire and overhead earth wire repairs, and for substations, circuit breaker and hot joint repairs.

Table C.3 Asset Tasks

All outstanding maintenance works carried into the bushfire danger period are prioritised based on the risk to the network in accordance with Transgrid's Bushfire Risk Management Plan, with residual risks being managed during any interim period in achieving 100%. Outstanding works are related to:

- Transmission line defects awaiting additional condition assessments
- Associated bushfire risks have been assessed as very low and therefore no additional controls have been implemented.

Substation asset defects awaiting confirmed outage bookings with additional inspections thermographic inspection to manage residual risks.

Asset Category	Status	Within bushfire prone areas						Outside bushfire prone areas					
		Work order priority					Totals	Work order priority					Totals
		1	2	3+3A	4	5[29]		1	2	3+3A	4	5	
		< 24 hours	< 1 month	< 6 months	< 12 months	Next outage /Maintenance /Manually set		< 24 hours	< 1 month	< 6 months	< 12 months	Next outage /Maintenance /Manually set	
Substation	Identified	5	16	18	4	0	43	14	18	12	4	0	48
	Completed	5	15	17	4	0	41	14	18	10	4	0	46
	Open	0	0	0	0	0	0	0	0	0	0	0	0
	Outstanding	0	1	1	0	0	2	0	0	2	0	0	2
Transmission Line	Identified	0	48	79	142	123	392	2	24	25	65	49	165
	Completed	0	48	79	142	123	392	2	24	25	59	42	152
	Open	0	0	0	0	0	0	0	0	0	0	0	0
	Outstanding	0	0	0	0	0	0	0	0	0	6	7	13
Automation	Identified	0	3	0	1	0	4	0	1	0	0	0	1
	Completed	0	3	0	1	0	4	0	1	0	0	0	1
	Open	0	0	0	0	0	0	0	0	0	0	0	0
	Outstanding	0	0	0	0	0	0	0	0	0	0	0	0
Network Property	Identified	7	32	71	5	0	115	0	2	0	1	0	3
	Completed	7	32	70	5	0	114	0	2	0	0	0	2
	Open	0	0	0	0	0	0	0	0	0	0	0	0
	Outstanding	0	0	1	0	0	1	0	0	0	1	0	1

29 Includes work orders where priority has been manually set by an authorised person

4. Glossary

Term	Description
Assisted failure	Any functional failure of a piece of equipment (component of an asset or asset) where the equipment was subject to an external force or energy source against which the network operator's standards for design and maintenance do not attempt to control
Fire	A state, process, or instance of combustion in which fuel or other material is ignited and combined with oxygen, giving off light, heat and flame. This includes 'smouldering' or 'smoke' events
Functional failure	Transgrid interprets a network asset functional failure to be the incident when the particular network asset types were unable to meet the expected or specified performance standard in the reporting period, thereby causing an outage or incident
Incident	Defined in accordance with IPART's *Electricity networks reporting manual - Incident reporting,* available on the IPART website
Major incident	Defined in accordance with IPART's *Electricity networks reporting manual - Incident reporting,* available on the IPART website
Network worker	A person who has been authorised by the network operator to plan or conduct work on or near the network. Includes persons employed by the network, persons engaged under a contract by the network operator, and persons authorised by the network operator and working for an Accredited Service Provider
Open (with respect to defects / tasks)	A defect / task that has not been rectified by the network operator but where the time that has elapsed since being identified has not exceeded the standard time that the network operator has set for having the defect rectified
Outstanding (with respect to defects / tasks)	A defect / task that has not been rectified by the network operator where the time that has elapsed since being identified has exceeded the standard time that the network operator has set for having the defect rectified.
Public worker	A party or parties that are conducting work that is not directly associated with the electricity network such as building work, landscaping, landfill work, excavations, road works and includes the construction, maintenance, adjustment or dismantling of mobile plant and scaffolding

Term	Description
Unassisted failure	Any functional failure of a piece of equipment (component of an asset or asset) where the cause of the failure is of a type for which the network operator's design and maintenance standards include specific controls to mitigate against the risk of failure and which is neither an assisted failure nor a maintenance induced failure. These failures are generally caused by a deterioration of the condition of the equipment and also include overhead connection failures and vegetation within the mandatory vegetation clearance window.

Transgrid Group

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